Water Resources Regional Planning

South Cumberland Pilot Area

Community Meeting
October 5, 2009
Monteagle, Tennessee

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What is the purpose of this community meeting?

- Inform the community of the need for the pilot and the process
- Encourage public participation throughout the process by:
  - Commenting on the process
  - Providing suggestions on alternatives to be considered

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Who are our technical partners in this regional planning pilot?

US Army Corps of Engineers
Nashville District

Tennessee Advisory Commission on Intergovernmental Relations

USGS science for a changing world

Tennessee Association of Utility Districts

TENNESSEE DEPARTMENT OF ECONOMIC & COMMUNITY DEVELOPMENT

The Nature Conservancy
Protecting nature. Preserving life.™

Tennessee Tech UNIVERSITY

Tennessee Duck River Development Agency
March 3, 1965

TVA

Tennessee Department of Agriculture

TENNESSEE WILDLIFE RESOURCES AGENCY

LAND TRUST FOR TENNESSEE
Life. Land. Legacy.

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What is the water resources regional planning pilot?

- Sustainably matching water sources with current & future needs
- Regional approach and multi-utility district focus
- Collaborative effort
- Areas selected based on 2007 drought stresses

Chattanooga Times Free Press

Photo of Laurel Lake by Meghan Brown

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What are the objectives / goals of the pilot?

- Ensure ability of water resources to sustain all uses
- Recommend source, conservation, efficiency and delivery alternatives to address water supply needs for a minimum of twenty years
- Provide information useful to capital financing source and management planning
- Provide information useful for development and growth decisions
- Serve as model for statewide water resources regional planning

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What are the benefits of water resources regional planning?

- Utilities, municipalities and counties work together to address water resource / supply issues
- Addresses needs of the region while minimizing demand on resources
- Funding advantages
- More immediate, effective drought response
- Increases sustainability by eliminating duplicate solutions and promoting efficiencies

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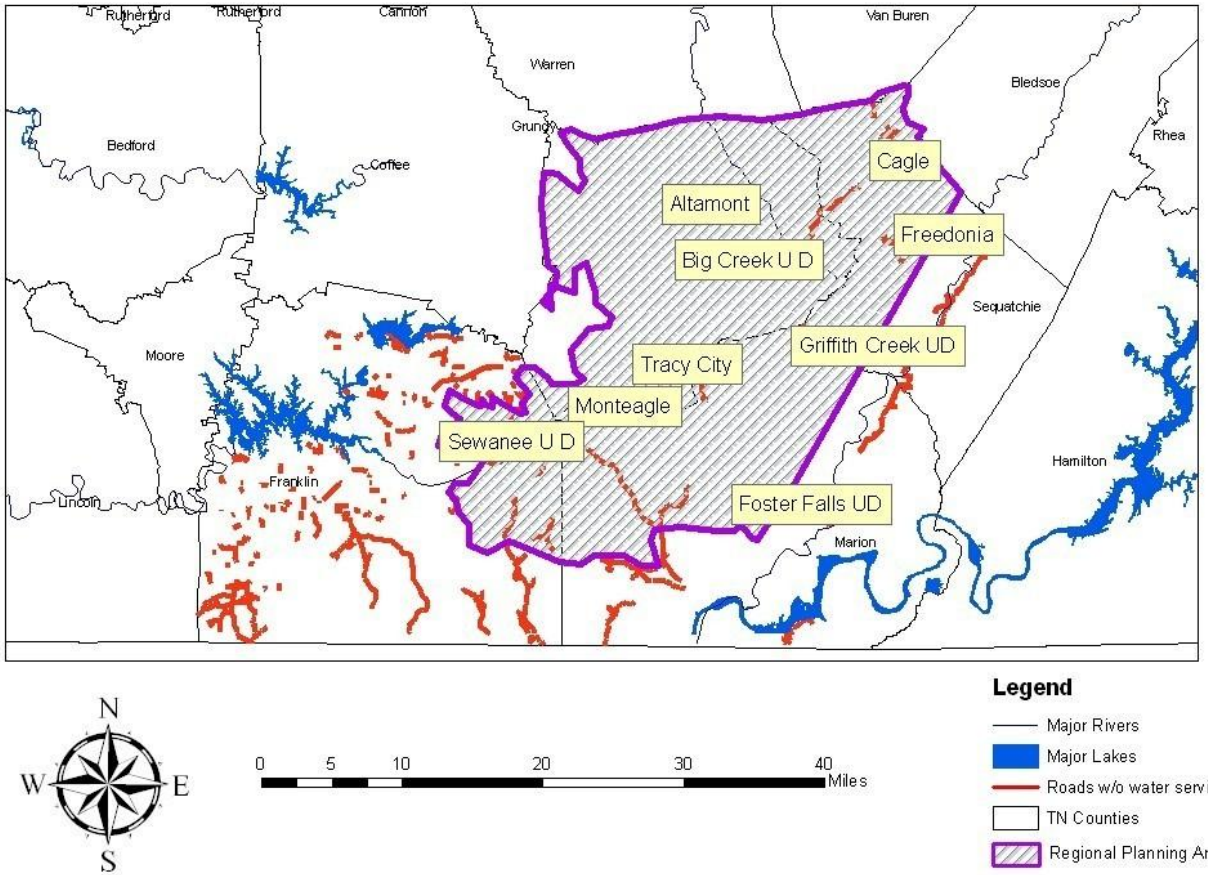
South Cumberland Pilot Area



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Elements of the water resources regional planning pilot

- Baseline information on the pilot area
- Assessment of the environment and ecological sensitivities
- Identification of the current water use and the structural capacities of the water systems
- Land use patterns

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Current Water Sources in the Pilot Area

Utility	Water Supply Source	Storage Capacity (MG)
Big Creek	Big Creek Reservoir	254
Monteagle	Lake Laurel - Primary	213
	Lake Louisa - Emergency	94
Sewanee	Lake O'Donnell - Primary	62
	Lake Jackson - Secondary	112
	Lake Dimmick (Day Lake) - Emergency	218
Tracy City	Big Fiery Gizzard Reservoir	200

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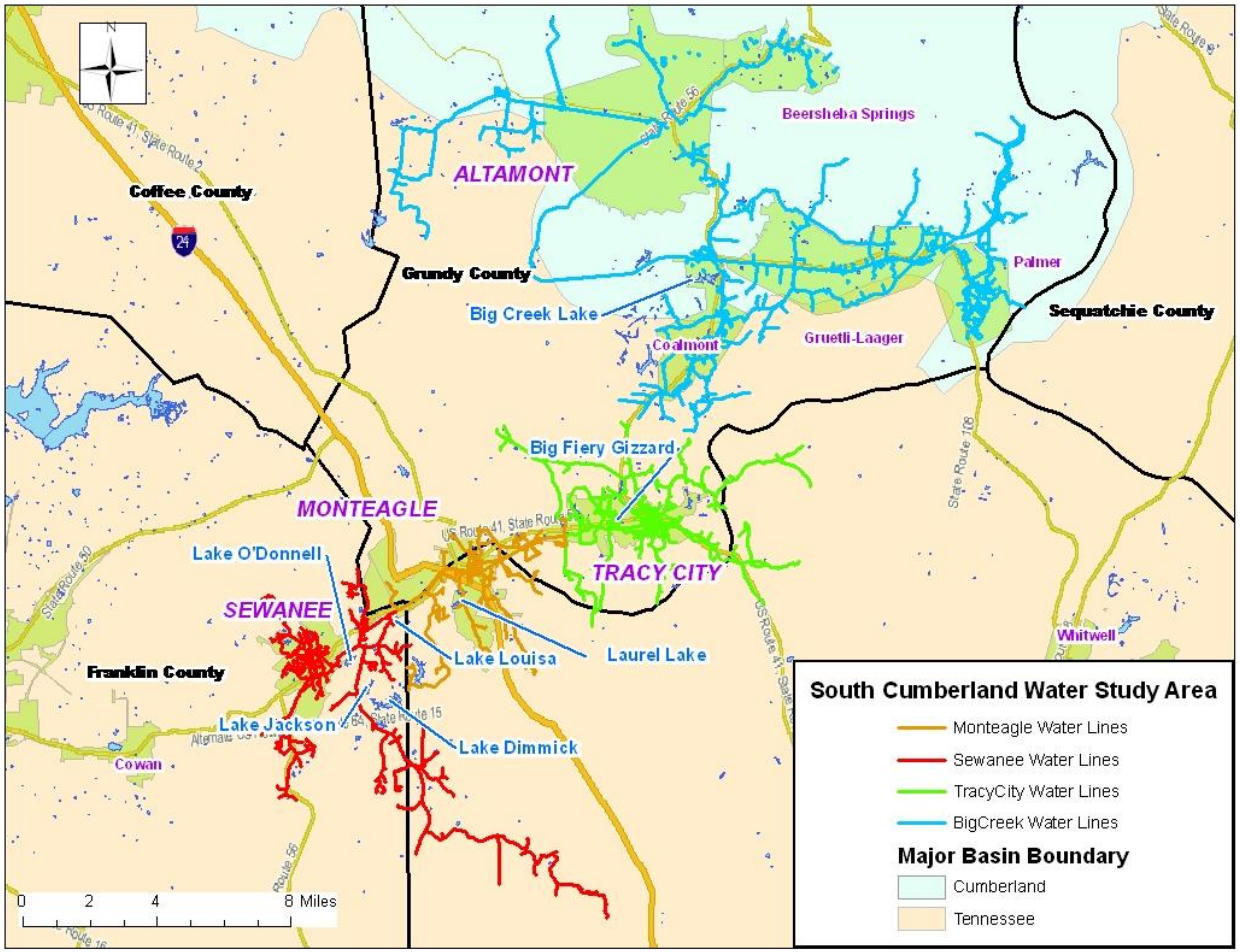
Utility Districts' Distribution Systems



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Existing Demand and Dependencies

WATER SYSTEMS	TREATMENT PLANT CAPACITY (mgd)	SOURCES/BUYERS/ SUPPLIERS	Withdrawal (mgd)	Water Purchased (mgd)	Water Sold (mgd)	Gross Water Use (mgd)
Big Creek	1.5	Big Creek Reservoir	1	-	-	0.765
		Cagle/Fredonia (buyer)	-	-	0.17	
		Griffith Creek (buyer)	-	-	0.065	
Monteagle	1	Lake Laurel	0.35	-	-	0.405
		Lake Louisa	-	-	-	
		Tracy City (seller)	-	0.055	-	
Sewanee	0.56	Lake O'Donnell	0.325	-	-	0.325
		Lake Jackson (Secondary)	(water is pumped from Jackson into O'Donnell)	-	-	
		Lake Dimmick (Emergency)	(water is pumped from Dimmick into Jackson)	-	-	
Tracy City	0.936	Fiery Gizzard	0.45	-	-	0.35
		Foster Falls (buyer)	-	-	0.045	
		Monteagle (buyer)	-	-	0.055	

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Elements of the water resources regional planning pilot (Cont.)

- Population and water demand projections
- Economic assessment
- Alternative(s) recommendation

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Critical Drought Analysis for Study Area

Standardized Precipitation Index – Drought identification based exclusively on precipitation conditions, computed with monthly data. Probability of occurrence for rainfall totals of selected duration.
Example: For a 3-month duration SPI in March, the index value is reflective of the probability of occurrence of the total precipitation for Jan - Mar, compared with all other Jan - Mar totals in the record.

SPI Values	
2.0+	extremely wet
1.5 to 1.99	very wet
1.0 to 1.49	moderately wet
-.99 to .99	near normal
-1.0 to -1.49	moderately dry
-1.5 to -1.99	severely dry
-2 and less	extremely dry

Drought	3	6	9	12	15	18	24	30	36	42	48	54	60
1930-1934	-2.50	-3.02	-3.20	-3.27	-3.02	-3.08	-2.92	-2.52	-1.96	-1.92	-2.09	-1.91	-1.92
1939-1942	-2.65	-2.81	-2.51	-2.04	-2.06	-1.97	-2.41	-2.38	-2.53	-2.33	-2.13	-2.32	-2.22
1944-1945	-3.98	-2.78	-2.00	-1.95	-1.39	-1.54	-1.56	-1.26	-1.32	-1.42	-1.81		
1960-1961	-2.56	-2.50	-2.04	-1.88	-1.55	-1.45	--	--	--	--	--	--	--
1963-1964	-3.22	-1.79	-1.21	--	--	--	--	--	--	--	--	--	--
1986-1988	-2.14	-2.65	-2.46	-2.29	-2.65	-2.49	-1.93	-1.95	-1.92	-2.01	-1.96	-2.06	-1.78
2007-2009	-2.97	-2.84	-3.31	-3.07	-3.24	-2.80	-2.91	-2.76	-2.63	-2.25	-2.02	-1.89	-1.19

Critical 3 to 6 Months Duration SPI Values for Droughts at Monteagle Station

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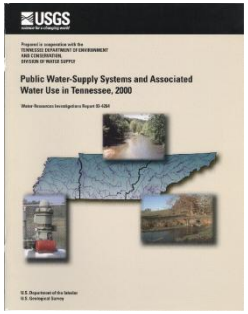
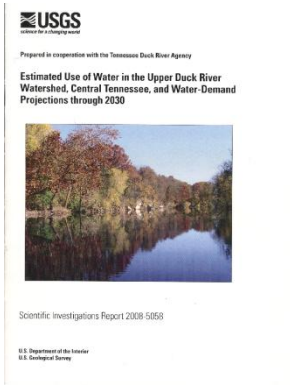
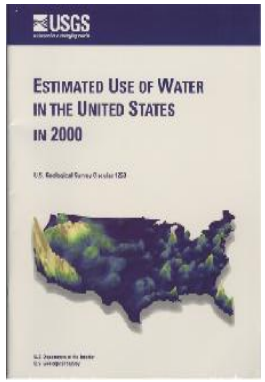
U.S. Geological Survey Water-Use Information

- Work with states to collect, QA/QC, and analyze water-use information nationwide
- Publish 5-year summary reports
- Study how much water is available; how much is used?
- What activities affect water availability?
- How does water-use affect surface or groundwater systems?
- What improvements can be made in how water use information is collected, stored, analyzed, and published?







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USGS Water-Use Information for Supply Planning

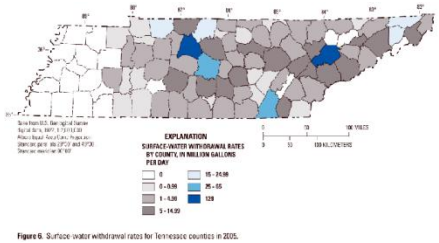

Figure 6. Surface-water withdrawal rates for Tennessee counties in 2005.

- Checking and verifying information, QA/QC, analysis of public supply records.
- Historical comparisons and analyses for trends in public supply records
- Comparing and validating public supply records against billing records by survey for 2005
- Estimating water use for agriculture irrigation and golf courses
- Collating input sets for demand forecast models.
- Gathering other explanatory information

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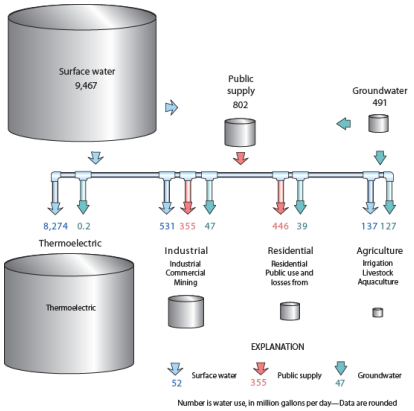
USGS Water-Use Demand Forecasting

- Forecast demand using model (IWR-MAIN)
- Key drivers include population, employment, and climate
- Forecasting method based on constant use rates for residential, commercial and industrial sectors
- Assumption: 2005 water system survey data includes all types of water use
- Projections for a period 20-50 years into future
- Develop and evaluate conservation scenarios



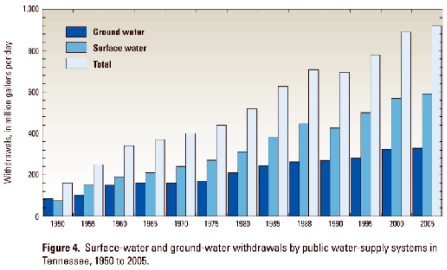


Figure 4. Surface-water and ground-water withdrawals by public water-supply systems in Tennessee, 1950 to 2005.

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Status of the Pilot

Preferred alternative

Spring 2010

- Multi-agency team working on specific assignments
- Baseline study final and posted on website
- Two meetings held with UDs and some elected officials
- Alternative evaluation in late 2009 / early 2010

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Water Resources Regional Planning

Website / Email address

http://tn.gov/environment/regionalplanning/

For any comments or questions related to the pilot contact us at: regional.planning@tn.gov

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Questions?

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